



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of

Toshiyuki MIYABAYASHI, et al. Group Art Unit: 1714

Serial No. 09/486,129

Examiner: C. Shosho

Filed: February 23, 1998

Docket No.: U-012618-1

For: INK COMPOSITION PROVIDING IMAGE EXCELENT IN LIGHT STABILITY

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Honorable Commissioner of Patents and Trademarks
United States Patent and Trademark Office
Washington, D.C. 20231

Sir:

DECLARATION UNDER 37 CFR 1.132

I, Toshiyuki MIYABAYASHI, the undersigned, do hereby declare:

1. THAT I am a co-inventor of the invention described and claimed in the above patent application.

2. THAT the following experiments were conducted under my direction and control:

(1) Preparation of Ink 6

Polymer emulsion B

Distilled water (200ml) and 0.6g of sodium dodecylbenzenesulfonate were charged into a reactor equipped with

an agitator, a reflux condenser, a dropping device, a thermometer, and a nitrogen inlet tube. In a nitrogen atmosphere, the temperature was raised to 70°C under agitation. 2g of potassium persulfate were further added thereto. Separately, 20g of butyl acrylate, 12g of benzyl methacrylate, 5g of methacrylic acid, 0.1g of t-dodecyl mercaptan, 18g of a monomer having a skeleton possessing an ultraviolet absorbing capacity, 2-(2-hydroxy-5'-methacryloxyethylphenyl)-2H-benzotriazole (RUVA-93, manufactured by Otsuka Chemical Co., Ltd.), 2g of a monomer having a skeleton possessing a light stabilizing capability, 1,2,2,6,6-pentamethyl-4-piperidyl methacrylate (ADK STB LA-82, manufactured by Asahi Denka Kogyo Ltd.) were mixed together to prepare a solution, and then the mixture was added dropwise to the reactor. The mixture was allowed to further react at 70 °C for 6 hours, and then cooled to room temperature. Aqueous ammonia, as a neutralizing agent to adjust pH, was added to the product. Then the product was filtrated through a 10µm-filter. Therefore a polymer emulsion comprising a fine particle of a polymer, which had a site possessing both of ultraviolet absorbing capacity and photo-stabilizing activity in its structure, as a dispersed particle, was prepared.

Preparation of Ink 6

The ink having the following composition was prepared.

C.I. Pigment Yellow 74	3.5 wt%
Polymer emulsion B	3.4 wt%
Glycerin	10.0 wt%
2-Pyrrolidone	2.0 wt%
Maltitol	4.0 wt%
Triethylene glycol mono-butyl ether	5.0 wt%
Surfynol 465	1.0 wt%
Potassium hydroxide	0.1 wt%
Pure water	Balance

(2) Evaluation of Ink compositions

Ink 6 obtained above was tested as follows. Blotted yellow images

(100% duty) were obtained on photo-quality paper (manufactured by Seiko Epson) with an ink jet printer (PM-700C, manufactured by Seiko Epson). Then, the printed paper was exposed to ultraviolet light (340 nm) with an irradiance of 0.5 W/m² by using a xenon weather-o-meter (Ci35A manufactured by ATLAS). The OD values were measured in dependence of the irradiation time for the ink. The retention of OD values was expressed according to following equation.

Change of OD value (%) = (OD value after irradiation)/(initial OD value) X 100

The results were as shown in the following table.

		Retention of OD value (%)			
Irradiation Energy (KJ/m ²)		0	167	357	556
Ink 6		100	97	90	80

3. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: July 16 , 2004

Toshiyuki Miyabayashi
Toshiyuki MIYABAYASHI